



TITLE

STANDARDIZED MEDICATION CONCENTRATIONS FOR PARENTERAL ADMINISTRATION

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Patient Safety

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If you have any questions or comments regarding the information in this policy, please contact Policy & Forms Department at policy@albertahealthservices.ca. The Policy website is the official source of current approved policies, procedures and directives.

PURPOSE

- To improve patient safety when ordering, preparing, and administering parenteral medications by standardizing medication concentrations across Alberta Health Services.
- To improve patient safety when ordering, preparing, and administering parenteral medications by limiting the number of concentrations and volume options available within the organization.
- To decrease the risk that **health care providers** will select, prepare, dispense, or administer the wrong concentration.

POLICY STATEMENT

- Except where otherwise indicated in this text, **standardized medication concentrations** for parenteral medications shall be used throughout Alberta Health Services for adult, pediatric and neonatal patients.
- Standardized medication concentrations for parenteral administration have been developed for a select group of medications:
 - focusing on **high-alert medications**;
 - addressing only certain routes of administration, depending on the medication; and
 - limiting the number of standardized concentrations per medication, taking into consideration the patient population (adult, pediatric and neonatal).
- Standardized medication concentrations for parenteral administration shall be in the medication monographs in the Alberta Health Services *Provincial Parenteral Manual*.
- Except where otherwise indicated in this text, medication concentrations that are specified in protocols, pre-printed care orders or order sets, or written by **authorized prescribers**, shall be selected from the standardized medication concentrations.

- Medications shall be prepared and administered utilizing the standardized medication concentrations.

APPLICABILITY

Compliance with this policy is required by all Alberta Health Services employees, members of the medical and midwifery staffs, students, volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary). This policy does not limit any legal rights to which you may otherwise be entitled.

POLICY ELEMENTS

1. Accreditation Canada Requirements

- 1.1 The goal/aim shall be to achieve standardization of medication concentrations at the provincial level.
- 1.2 Zones may continue to use existing standardized medication concentrations until such time as provincial standardized concentrations can be safely implemented.

2. Process

- 2.1 Specific criteria shall be used to determine standardized medication concentrations. (See Appendix A *Criteria for Determining Standardized Medication Concentrations*.)
- 2.2 Standardized medication concentrations shall be prepared and administered according to the instructions in the Alberta Health Services *Provincial Parenteral Manual* monographs.
- 2.3 The medication concentrations selected to be included in medication libraries for pumps with **dose error reduction software (DERS)**, also known as **SMART** pumps, must be consistent with the standardized medication concentrations as specified in the Alberta Health Services *Provincial Parenteral Manual* monographs.
 - a) If any of the standardized medication concentrations are not included in the pump medication library, and then a need for the medication and/or concentration arises, manual programming of the pump shall be verified through an **independent double-check**.
- 2.4 If a non-standardized medication concentration is to be administered, manual programming of the pump shall be verified through an independent double-check.
- 2.5 Requests for additions or changes to the provincial standardized medication concentrations shall be directed to the Provincial Pharmacy Services Medication Quality & Safety Team web page on Insite.
- 2.6 During the evaluation process for admission of new parenteral medications to the formulary, Pharmacy Services Drug Utilization Team shall consult with Pharmacy

Services Medication Quality and Safety Team to determine if there is a need to create a provincial standardized concentration for the new medication.

3. Responsibility

- 3.1 Authorized prescribers shall demonstrate commitment to the safety of all patients by adhering to the provincial standardized medication concentrations policy and procedures.
- 3.2 Alberta Health Services Pharmacy Services shall demonstrate commitment to the safety of all patients by:
- a) purchasing the standardized medication concentrations in a **ready-to-administer** format, whenever possible;
 - b) compounding and dispensing the standardized medication concentrations to patient care settings in a ready-to-administer format, when pharmacy sterile manufacturing services are available;
 - c) limiting the number of volume options for standardized medication concentrations as appropriate;
 - d) aligning the Alberta Health Services *Provincial Drug Formulary* to reflect the provincial standardized medication concentrations;
 - e) updating the provincial *Parenteral Medication Monographs* to reflect the standardized medication concentrations;
 - f) co-ordinating and communicating any additions or changes of the standardized medication concentrations to stakeholders; and
 - g) participating in the auditing process as directed by Zone Operations.
- 3.3 Alberta Health Services physicians and other **health care professionals** shall demonstrate commitment to the safety of all patients by:
- a) mixing and/or administering parenteral medications using the standardized medication concentrations (subject to section 4.1), and
 - b) participating in the auditing process as directed by Zone Operations.
- 3.4 Zone Operations shall demonstrate commitment to the safety of all patients by:
- a) auditing compliance with the standardized medication concentrations (see *Adult Standardized Medication Concentrations for Parenteral Administration* Procedure section 5; and, *Neonatal Standardized Medication Concentrations for Parenteral Administration* Procedure section 5, and

- b) reviewing the audit results to determine where there is lack of compliance, the reason for lack of compliance, and if any change to the standardized medication concentrations is required.

4. Exceptions

- 4.1 The ordering of a non-standardized medication concentration by an authorized prescriber should occur only if there is an extenuating clinical situation where the standardized medication concentration does not meet the clinical needs of the patient.
 - a) The authorized prescribers should document the clinical reason for the deviation from the standardized medication concentration (see *Adult Standardized Medication Concentrations for Parenteral Administration* Procedure section 1.4; and, *Neonatal Standardized Medication Concentrations for Parenteral Administration* Procedure section 1.3).
 - b) Calculations, medication preparation, and infusion pump settings for non-standardized medication concentrations shall be verified through an independent double-check.
- 4.2 In the pre-hospital setting, Emergency Medical Services shall continue to follow Emergency Medical Services *Provincial Medical Control Protocols: Adult and Pediatric* with regard to medication concentrations.
- 4.3 During interfacility transfers, Emergency Medical Services shall, whenever possible, follow this policy and the Alberta Health Services *Provincial Parenteral Manual* monographs with regard to standardized medication concentrations.
- 4.4 In the community setting, where parenteral infusions may be provided in non-standardized medication concentrations by non-Alberta Health Services suppliers, health care providers shall, whenever possible, follow this policy and the Alberta Health Services *Provincial Parenteral Manual* monographs with regard to standardized medication concentrations.

5. Special Labelling

- 5.1 When more than one standardized medication concentration is provided as wardstock in a patient care environment, special labelling shall be required to identify the higher concentration. (See *Adult Standardized Medication Concentrations for Parenteral Administration* Procedure section 3.1 b, and *Appendix A Labels – Standardized Medication Concentrations for Adults*; and, *Neonatal Standardized Medication Concentrations for Parenteral Administration* Procedure section 3.1 b, and *Appendix A Labels – Standardized Medication Concentrations for Neonates*.)
- 5.2 If deviating from the standardized medication concentrations, a special label shall be required to identify the non-standardized medication concentration. (See *Adult Standardized Medication Concentrations for Parenteral Administration* Procedure

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3.1 d and 3.2 b, and Appendix A *Labels – Standardized Medication Concentrations for Adults*; and, *Neonatal Standardized Medication Concentrations for Parenteral Administration* Procedure section 3.1 d & 3.2 b & Appendix A *Labels – Standardized Medication Concentrations for Neonates*.)

DEFINITIONS

Authorized prescriber means a health care professional who is permitted by Federal and Provincial legislation, her/his regulatory college, Alberta Health Services, and practice setting (where applicable) to prescribe medications.

Dose error reduction software (DERS) means pre-determined programming for compatible pumps with digital memory, including minimum and maximum doses and minimum and maximum rates of administration for given standard concentrations of solution. Pumps that use this technology are also known generally as ‘SMART’ or smart technology pumps.

Health care professional means an individual who is a member of a regulated health discipline, as defined by the *Health Disciplines Act* [Alberta] or the *Health Professions Act* [Alberta], and who practises within scope and role.

Health care provider means any person who provides goods or services to a patient, inclusive of health care professionals, staff, students, volunteers and other persons acting on behalf of or in conjunction with Alberta Health Services.

High-alert medications means medications that bear a heightened risk of causing significant patient harm when they are used in error. (Institute for Safe Medication Practices [ISMP], 2012)

Independent double check means a verification process whereby a second health care professional conducts a verification of another health care professional’s completed task. The most critical aspect is to maximize the independence of the double check by ensuring that the first health care professional does not communicate what he or she expects the second health care professional to see, which would create bias and reduce the visibility of an error.

Ready-to-administer means that the medication is available in a format that can be administered without any further adaptations such as adding medication or diluent.

SMART (pump) means ‘Safer Medication Administration thRough Technology’.

Standardized medication concentrations means medication concentrations that have been established based on stakeholder input for specific formulary parenteral medications, focusing on the Institute for Safe Medication Practices *ISMP’s List of High-Alert Medications*. The medications for which standardized concentrations have been established will differ for adult, pediatric and neonatal patients. For some medications there will be more than one standardized concentration. The standardized concentrations do not apply to all routes of administration for each medication. Refer to the Alberta Health Services *Provincial Parenteral Manual* monographs to ascertain the standardized medication concentrations.

REFERENCES

- Appendix A *Criteria for Selecting Standardized Medication Concentrations*
- Alberta Health Services *Adult Standardized Medication Concentrations for Parenteral Administration Procedure*
- Alberta Health Services *Neonatal Standardized Medication Concentrations for Parenteral Administration Procedure*
- Accreditation Canada *Managing Medication Standards* (For Surveys Starting After January 1, 2014)
- Institute for Safe Medication Practices *ISMP's List of High-Alert Medications* (2012 version)

REVISIONS

N/A

APPENDIX A

Criteria for Determining Standardized Medication Concentrations

1. The medication must be on the Alberta Health Services Provincial Drug Formulary.
2. The standardized medication concentrations should meet the needs of the majority of the patient population.
3. Preference shall be given to standardized medication concentrations that are common, first across clinical practice areas and then across the province.
4. Preference shall be given to standardized medication concentrations available in a commercially manufactured ready-to-administer format.
5. Preference shall be given to standardized medication concentrations that match the United States of America proposed National Standard Concentrations. (It is more likely that these concentrations will become available in a ready-to-administer format by the manufacturer.)
6. Preference shall be given to standardized medication concentrations that minimize medication wastage.
7. Preference shall be given to standardized medication concentrations that minimize manipulation at the bedside.
8. Preference shall be given to standardized medication concentrations that simplify dose titration or calculations (e.g., heparin 100 units/mL and insulin one [1] unit/mL).
9. Preference shall be given to creating different standardized medication concentrations for look-alike, sound-alike medications (e.g., doBUTamine and doPAMine), where possible.
10. Standardized medication concentrations should allow a measurable infusion rate while avoiding excessive fluid intake when administered in the usual dosage range.
11. Standardized medication concentrations should be tolerated for peripheral administration; additional higher standardized medication concentrations can be identified for central administration, if required.
12. When there is a need to create more than one standardized medication concentration for a medication, preference shall be given to concentrations that are not a 10-fold increase over the lower standardized concentration.
13. For ease of calculations, preference shall be given to choosing a higher standardized medication concentration at double the lower standardized medication concentration.
14. Preference shall be given to establishing the minimum number of standardized concentrations per medication.
15. Preference shall be given to having one adult standardized medication concentration that meets the needs of the larger (greater than 40 kilogram) pediatric patients.